

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 and 6 are amended and now read as follows:

1. (Currently Amended) A circuit arrangement for operating an exhaust-gas probe including a NOx double chamber sensor, said exhaust-gas probe including: a heatable solid-state electrolyte body having first and second pump chambers; diffusion barriers  
5 for separating said chambers from each other and from the exhaust gas; a third chamber communicating with the atmosphere; an external pump electrode exposed to the exhaust gas; a first oxygen pump electrode disposed in said first pump chamber; a second oxygen pump electrode disposed in at least one of said  
10 first and second pump chambers; a nitrogen oxide pump electrode disposed in said second pump chamber; an air reference electrode disposed in said third chamber; and, said circuit arrangement comprising:

circuit means for applying pregiven voltages to said  
15 electrodes, respectively, and for generating, in a controlled manner, the following: a first oxygen pump current between said first oxygen pump electrode and said external pump electrode; a second oxygen pump current ~~between~~ from said second oxygen pump electrode and via said first oxygen pump electrode to said

20 external pump electrode; and, a nitrogen oxide pump current  
between from said nitrogen oxide pump electrode and via said  
first oxygen pump electrode to said external pump electrode; and,  
said circuit means including: only one pump voltage  
generating circuit unit; switching means for switching said pump  
25 voltage generating circuit unit between respective ones of said  
pump electrodes; and, said pump voltage generating unit  
functioning to generate, in a controlled manner, all of the  
voltages applied to said pump electrodes in dependence upon  
respective reference voltages.

2. (Original) The circuit arrangement of claim 1, said pump  
voltage generating circuit unit including an operational  
amplifier; said switching means being switchable to connect  
respective ones of said reference voltages and respective ones of  
5 said voltages applied to said pump electrodes to said operational  
amplifier which compares a corresponding one of said reference  
voltages to a corresponding one of said voltages applied to said  
pump electrodes; and, said pump voltage generating circuit unit  
further including means for minimizing deviations of each of said  
10 voltages applied to said pump electrodes from the corresponding  
one of said reference voltages.

3. (Original) The circuit arrangement of claim 2, said  
minimizing means including a plurality of integrators connected  
to corresponding ones of three of said pump electrodes; said  
switching means including ancillary switching means for  
5 connecting the output of said operational amplifier sequentially

to said integrators which integrate corresponding ones of the fault signals outputted by said operational amplifier; a plurality of current measuring circuits connected downstream of corresponding ones of said integrators with said current  
10 measuring circuits measuring the pump currents flowing in respective ones of said pump electrodes and outputting voltage values proportional thereto.

4. (Original) The circuit arrangement of claim 1, said switching means being configured in CMOS technology.

5. (Original) The circuit arrangement of claim 1, further comprising a clock generator for periodically switching said switching means at a frequency in the kilohertz range.

6. (Currently Amended) A combination of an exhaust-gas probe and a circuit arrangement for operating the exhaust-gas probe, the combination including:

5 said exhaust-gas probe including: a heatable solid-state electrolyte body having first and second pump chambers; diffusion barriers for separating said chambers from each other and from the exhaust gas; a third chamber communicating with the atmosphere; an external pump electrode exposed to the exhaust gas; a first oxygen pump electrode disposed in said first pump  
10 chamber; a second oxygen pump electrode disposed in at least one of said first and second pump chambers; a nitrogen oxide pump electrode disposed in said second pump chamber; an air reference electrode disposed in said third chamber; and,

said circuit arrangement including: circuit means for  
15 applying pregiven voltages to said electrodes, respectively, and  
for generating, in a controlled manner, the following: a first  
oxygen pump current between said first oxygen pump electrode and  
said external pump electrode; a second oxygen pump current  
between from said second oxygen pump electrode and via said first  
20 oxygen pump electrode to said external pump electrode; and, a  
nitrogen oxide pump current between from said nitrogen oxide pump  
electrode and via said first oxygen pump electrode to said  
external pump electrode; and,

said circuit means including: only one pump voltage  
25 generating circuit unit; switching means for switching said pump  
voltage generating circuit unit between respective ones of said  
pump electrodes; and, said pump voltage generating unit  
functioning to generate, in a controlled manner, all of the  
voltages applied to said pump electrodes in dependence upon  
30 respective reference voltages.

7. (Previously Presented) The combination of claim 6, said pump  
voltage generating circuit unit including an operational  
amplifier; said switching means being switchable to connect  
respective ones of said reference voltages and respective ones of  
5 said voltages applied to said pump electrodes to said operational  
amplifier which compares a corresponding one of said reference  
voltages to a corresponding one of said voltages applied to said  
pump electrodes; and, said pump voltage generating circuit unit  
further including means for minimizing deviations of each of said  
10 voltages applied to said pump electrodes from the corresponding

one of said reference voltages.

8. (Previously Presented) The combination of claim 7, said minimizing means including a plurality of integrators connected to corresponding ones of three of said pump electrodes; said switching means including ancillary switching means for  
5 connecting the output of said operational amplifier sequentially to said integrators which integrate corresponding ones of the fault signals outputted by said operational amplifier; a plurality of current measuring circuits connected downstream of corresponding ones of said integrators with said current  
10 measuring circuits measuring the pump currents flowing in respective ones of said pump electrodes and outputting voltage values proportional thereto.

9. (Previously Presented) The combination of claim 6, said switching means being configured in CMOS technology.

10. (Previously Presented) The combination of claim 6, further comprising a clock generator for periodically switching said switching means at a frequency in the kilohertz range.